Supplemental Specification
2005 Standard Specification Book

SECTION 03339

PRECAST CONCRETE DECK PANEL

Add Section 03339

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This work consists of furnishing, erecting, and grouting all precast concrete deck and approach slab panels including all necessary materials and equipment to complete the work as shown on the plans.

B. Placing structural non-shrink grout into the girder camber strips and filling the shear stud blockouts in the bridge precast concrete deck panels. This is not for post-tensioning operation.

C. Procedures for preparing and installing structural non-shrink grout.

1.2 RELATED SECTIONS

A. Section 03055: Portland Cement Concrete

B. Section 03211: Reinforcing Steel and Welded Wire

C. Section 03310: Structural Concrete

1.3 REFERENCES

A. AASHTO T 106: Compressive Strength of Hydraulic Cement Mortar

B. AASHTO T 160: Length Change of Hardened Hydraulic Cement Mortar and Concrete

C. AASHTO T 161: Standard Method of Test for Resistance of Concrete to Rapid Freezing and Thawing

D. AASHTO T 260: Standard Method of Test for Sampling and Testing Chloride Ion in Concrete and Concrete Raw Materials

E. ASTM C 666: Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing

F. ASTM C 882: Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear

G. ASTM C 1042: Standard Test Method For Bond Strength of Latex Systems Used with Concrete by Slant Shear

H. ASTM E 274: Standard Test Method for Skid Resistance of Paved Surfaces Using a Full-Scale Tire

I. UDOT Quality Management Plan

1.4 SUBMITTALS

A. Precast Concrete Deck Panel
   1. Shop Drawings furnished to the Engineer for approval 14 days before panel construction begins:
      a. Five sets half-size, 11½ x 17 inch sheets with a 1½ inch blank margin on the left-hand edge.
      b. Place the project designation data in the lower right-hand corner of each sheet.
      c. Prepare shop drawings under seal of a Professional Engineer.
   2. Department rejects units fabricated before written approval.

B. Construction Methods
   1. Provide construction methods to Engineer for approval 14 days before construction begins.
   2. Submit five copies of shop drawings to the Engineer for approval. Drawings designed by a Professional Engineer include but are not limited to the following:
      a. Type and location of lifting inserts or devices.
      b. Details of vertical adjusting hardware.
   3. Do not order materials or begin work until receiving final approval of the shop detail drawings.
   4. All details are subject to modification or approval.
   5 Do not deviate from the approved shop drawings unless authorized in writing. Contractor is responsible for costs incurred due to faulty detailing or fabrication.

C. Erection Plan
   1. Follow the sequence shown on the plans to remove the existing bridge deck slab and erect the new deck composed of precast concrete deck panels.

2. Submit a detailed plan to Engineer for approval 14 days before the panel erection begins. This detailed plan will include, but not be limited to the following information:
   a. Approximate location of cranes.
   b. Method of forming closure joints.

D. Structural Non-Shrink Grout
   1. Certificate of Compliance to Engineer.
   2. Submit a proposed method for forming the girder camber strips and installing the structural non-shrink grout, sequence, and equipment for grouting operation to Engineer for approval 14 days before placing structural non-shrink grout begins.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use Class AA (AE) concrete for precast concrete deck panels as specified in Section 03055 and on the plans. Self-consolidating concrete mix designs may be submitted to Engineer for approval as an alternate to the structural concrete for the precast deck panels.

B. Use coated reinforcing steel as specified in Section 03211.

C. Show vertical adjusting hardware devices on the plans. Alternative devices may be substituted with approval from the Engineer.

D. Use mechanical threaded couplers when specified for precast concrete deck panel reinforcing as specified in Section 03211.

E. Use structural non-shrink grout for girder camber strips and shear stud blockouts.
   1. Mix structural non-shrink grout just prior to use, in accordance with the manufacturer's instructions.
   2. Use concrete gray in color and containing no calcium chloride or admixture containing calcium chloride or other ingredient in sufficient quantity to cause corrosion to steel reinforcement.
   3. Use quick-setting, rapid strength gain, non-shrink, and high-bond strength grout.
   4. Warranty the in-place structural non-shrink grout performance and workmanship for two years.
   5. Repair or refund at the Department's option any bonding failures that occur during the warranty period.

6. Use structural non-shrink grout that meets a minimum compressive strength of 3,000 psi within 24 hours and 5,000 psi within seven days when tested as specified in AASHTO T 106.
7. Meet all the requirements of AASHTO T 160 with the exception that the Contractor-supplied cube molds will remain intact with a top firmly attached throughout the curing period.
8. Use structural non-shrink grout having no expansion after seven days and a one-hour compressive strength of 500 psi.
9. Refer to Table 1 for structural non-shrink grout requirements.

Table 1

Structural Non-Shrink Grout			
***Properties**	**Requirements**	**ASTM**	**AASHTO**
Accelerated Weathering	As Specified in ASTM or AASHTO	C 666	T 260
Accepted Bond Strengths	>1,000 psi @ 24 Hours	C 882 or C 1042	
Test Medium	<3% White Utah Road Salt		T 161
Accepted Weight Loss	<15% @ 300 Cycles		T 161
Friction Number	>40	E 274	

* Certified test results from a private AASHTO accredited testing laboratory will suffice for acceptance.

F. Use a UDOT Certified Concrete Precaster or a pre-qualified project site caster for concrete products in accordance with the Department Quality Management Plan: Precast-Prestressed Concrete Structures.

G. Cure all panels for a minimum of 14 days prior to placing on superstructure.

PART 3 EXECUTION

3.1 FABRICATION

A. Do not place concrete in the forms until the Engineer has inspected and approved the placement of all materials in the deck panels.

B. Finish the precast concrete deck panels following Section 03310.

3.2 PLACING PRECAST CONCRETE DECK PANELS

A. Place the precast concrete deck panels as shown on the plans.

B. Check the grade of the deck panels after all deck panels in a span are placed and adjusted to provide the elevations shown on the plans.

C. After the proper grade is achieved, prevent shifting of the precast concrete deck panels during the joining of all the deck panels.

3.3 PREPARATION AND INSTALLATION OF STRUCTURAL NON-SHRINK GROUT

A. Clean and remove all debris from the girder camber strips and shear stud blockouts prior to placement of the structural non-shrink grout.

B. Keep bonding surfaces free from laitence, dirt, dust, paint, grease, oil, rust, or any contaminant other than water.

C. Pre-test the materials under field conditions at the grout pocket and camber strip anticipated to determine whether subsequent cracking will occur.
   1. The corrective action will be at the discretion of the Engineer.
   2. Proceed with grouting process at the direction of the Engineer.

D. Saturate surface dry (SSD) all surfaces receiving structural non-shrink grout.

E. Apply product following manufacturer's recommendations preparation and installation.

F. Cure structural non-shrink grout per manufacturer's recommendation.
   1. Contact the manufacturer's representative for advice on how to reduce heat such as wet curing or adding retarding admixture if the heat of hydration is excessive.

G. Use a mix design in accordance with the requirements of Section 03055 if adding more than 15 lb of coarse aggregate (size No. 8) or larger per 50 lb bag of structural non-shrink grout.

H. Place structural non-shrink grout in the girder camber strips and shear stud blockouts in a continuous operation within a panel after all panels and shear studs are fully installed.

I. Form the girder camber strips as shown on the plans after shear studs are installed at the locations shown on the plans.
   1. Grout the shear stud blockouts and girder camber strips using structural non-shrink grout.

J. Do not allow voids in the grout for the girder camber strips and shear stud blockouts.

K. Do not apply superimposed dead loads or live loads to the precast concrete deck panels until the structural non-shrink grout in the shear stud blockouts and the girder camber strips have been in place for two hours.

END OF SECTION